

1 market and book values are equal, a rare and unlikely situation. In recent years, the market values
2 of utilities' common stocks have been well in excess of their book values as shown on Exhibit No. 7,
3 page 1 of Schedule 4 ranging between 132.9% and 195.3% for the proxy group of seven water
4 companies and between 150.8% and 176.9% for the proxy group of eight utilities as shown on page
5 1 of Schedule 5.

6 Mathematically, the DCF model understates investors' required return rate when market
7 value exceeds book value because, in many instances, market prices reflect investors' assessments
8 of long-range market price growth potentials (consistent with the infinite investment horizon implicit
9 in the standard regulatory version of the DCF model) not fully reflected in analysts' shorter range
10 forecasts of future growth for earnings per share (EPS) and dividends per share (DPS) accounting
11 proxies. This indicates the need to better match market prices with investors' longer range growth
12 expectations embedded in those prices. However, the understatement of investors' required return
13 rate associated with the application of the market price-based DCF model to the book value of
14 common equity clearly illustrates why reliance upon a single common equity cost rate model should
15 be avoided. As mentioned previously, the majority of regulatory commissions, including the Illinois
16 Commerce Commission (ICC), do not rely upon any one method to determine common equity cost
17 rate (See Exhibit No. 7), Schedule 6).

18
19 Q. Is there support in the academic literature for the need to rely upon more than one cost of common
20 equity model in arriving at a recommended common equity cost rate?

21
22 A. Yes. For example, Phillips¹² states:

23 Since regulation establishes a level of authorized earnings which, in turn, implicitly
24 influences dividends per share, *estimation of the growth rate from such data is an*
25 *inherently circular process. For these reasons, the DCF model "suggests a degree*
26

¹² Charles F. Phillips, Jr., The Regulation of Public Utilities-Theory and Practice, 1993, Public Utility Reports, Inc., Arlington, VA, p. 396, 398.

1 of precision which is in fact not present" and leaves "wide room for controversy and
2 argument about the level of k". (italics added) (p. 396)

3
4 * * *

5
6 Despite the difficulty of measuring relative risk, the comparable earnings standard is
7 no harder to apply than is the market-determined standard. The DCF method, to
8 illustrate, requires a subjective determination of the growth rate the market is
9 contemplating. Moreover, as Leventhal has argued: *'Unless the utility is permitted*
10 *to earn a return comparable to that available elsewhere on similar risk, it will not be*
11 *able in the long run to attract capital.'* (italics added) (p. 398)

12
13 Also, Morin¹³ states:

14
15 Sole reliance on the DCF model ignores the capital market evidence and financial
16 theory formalized in the CAPM and other risk premium methods. The DCF model is
17 one of many tools to be employed in conjunction with other methods to estimate the
18 cost of equity. *It is not a superior methodology that supplants other financial theory*
19 *and market evidence. The broad usage of the DCF methodology in regulatory*
20 *proceedings does not make it superior to other methods.* (italics added) (pp. 231-
21 232)

22
23 Each methodology requires the exercise of considerable judgment on the
24 reasonableness of the assumptions underlying the methodology and on the
25 reasonableness of the proxies used to validate a theory. *The failure of the traditional*
26 *infinite growth DCF model to account for changes in relative market valuation,*
27 *discussed above, is a vivid example of the potential shortcomings of the DCF model*
28 *when applied to a given company. It follows that more than one methodology should*
29 *be employed in arriving at a judgment on the cost of equity and that these*
30 *methodologies should be applied across a series of comparable risk companies.*
31 *...Financial literature supports the use of multiple methods.* (italics added) (p. 239)

32
33 Professor Eugene Brigham, a widely respected scholar and finance academician asserted:

34
35 *In practical work, it is often best to use all three methods -CAPM, bond yield plus risk*
36 *premium, and DCF - and then apply judgement when the methods produce different*
37 *results. People experienced in estimating capital costs recognize that both careful*
38 *analysis and very fine judgements are required. It would be nice to pretend that*
39 *these judgements are unnecessary and to specify an easy, precise way of*
40 *determining the exact cost of equity capital. Unfortunately, this is not possible.*
41 (italics added) (pp. 239-240)

42
43 Another prominent finance scholar, Professor Stewart Myers, in his best-selling corporate
44 finance textbook stated:

45
46 *The constant growth formula and the capital asset pricing model are two different*
47 *ways of getting a handle on the same problem.* (italics added) (p. 240)

48
49 In an earlier article, Professor Myers explained the point more fully:

50
51 *Use more than one model when you can. Because estimating the opportunity cost*

13
Roger A. Morin, Regulatory Finance-Utilities' Cost of Capital, 1994, Public Utilities Reports, Inc.,
Arlington, VA, pp. 231-232, 239-240.

of capital is difficult, only a fool throws away useful information. That means you should not use any one model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data. (italics added) (p. 240)

2. Applicability of a Market-Based Common Equity Cost Rate to a Book Value Rate Base

Q. Is it reasonable to expect the market values of utilities' common stocks to continue to sell well above their book values?

A. Yes. I believe that the common stocks of utilities will continue to sell substantially above their book values, because many investors, especially individuals who traditionally committed less capital to the equity markets, will likely continue to commit a greater percentage of their available capital to common stocks in view of lower interest rate alternative investment opportunities and to provide for retirement. The recent past and current capital market environment is in stark contrast to the late 1970's and early 1980's when very high (by historical standards) yields on secured debt instruments in public utilities were available.

The significant recent increases in market-to-book ratios have been influenced by factors other than fundamentals such as actual and reported growth in earnings per share (EPS) and dividends per share (DPS). For example, David Wessel in the Wall Street Journal states:¹⁴

So if the fundamentals aren't driving stock prices, then what is? It's that hard-to-quantify investor appetite for buying stocks. The market has been strong because lots of people want to hold stocks. It will continue to be strong as long as they continue to be willing to pay more for stocks than they used to.

* * *

Psychoanalyzing investors is a favorite pastime, from Wall Street saloons to American livingrooms. Perhaps baby boomers, intent on saving for retirement and their children's college tuition, see stocks as the only smart alternative. Perhaps Generation-Xers fear Social Security will vanish before they retire, and are bulking up on stocks. Perhaps mutual-fund marketing has diverted billions of dollars that once would have ended up in low-interest

¹⁴ "If This is a Bubble, It Sure is Hard to Pop," Wall Street Journal, March 30, 1999, pp. A1 and A6.

Moreover, allowed ROEs have a limited effect on utilities' market/book ratios as market prices of common stocks are influenced by a number of other factors beyond the direct influence of the regulatory process.

For example, Phillips¹⁵ states:

Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.'

In addition, Bonbright¹⁶ states:

In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently volatile stock market.* In short, market prices are beyond the control, though not beyond the influence of rate regulation. Moreover, even if a commission did possess the power of control, any attempt to exercise it ... would result in harmful, uneconomic shifts in public utility rate levels. (italics added)

In view of the foregoing, a mismatch often results in the application of the DCF model as market prices reflect long range expectations of growth in market prices (consistent with the presumed infinite investment horizon of the standard DCF model), while the short range forecasts of growth in accounting proxies, i.e., EPS and DPS, do not reflect the full measure of growth (market price appreciation) expected in per share market value.

Q. Please describe the information shown on Schedule 7.

A. Schedule 7 demonstrates that the market prices of common stocks have not been driven only by growth in EPS and/or DPS. Schedule 7 shows the stock price index levels, EPS and DPS of the

¹⁵ Id., at p. 395.

¹⁶ James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates, 1988, Public Utilities Reports, Inc., Arlington, VA, p. 334.

1 S&P Utilities and S&P 500 Composite Indices on a quarterly basis from the third quarter of 1988
2 through the third quarter of 1999.

3 It is shown at the bottom of Schedule 7 that the S&P Utilities Index experienced a 70.54%
4 increase in market price over ten years, while growth in DPS over the periods was only 29.00%
5 and growth in EPS was 52.57% over a recent ten-year period. In addition, the S&P 500
6 Composite Index experienced a 267.38% increase in market price, 85.50% increase in EPS and
7 55.95% increase in DPS.

8 It is clear from the foregoing that many factors influence market prices and that allowed
9 or even achieved rates of return on book common equity have a limited effect on utilities' market-
10 to-book ratios because the market prices of common stocks are influenced by many factors
11 beyond the control of regulators.

12
13 Q. Please explain why a DCF-derived common equity cost rate mis-specifies investors' expected
14 common equity cost rate when the market/book ratio is greater or less than unity (100%).

15
16 A. Under the DCF model, the rate of return investors require is related to the price paid for a stock,
17 i.e., market price is the basis upon which they formulate the required rate of return. A regulated
18 utility is limited to earning on its net book value (depreciated original cost) rate base. As
19 discussed previously, market values differ from book values for many reasons unrelated to
20 earnings. Thus, when market values differ significantly from book values, a market-based DCF
21 cost rate applied to the book value of common equity will not accurately reflect investors' expected
22 common equity cost rate. It will either overstate or understate investors' expected common equity
23 cost rate (without regard to any adjustment for flotation costs which may, at times, be appropriate
24 on an ad hoc basis) depending upon whether market value is less than or greater than book
25 value.

26 Exhibit No. 7, Schedule 8 demonstrates the inadequacy of a market-based DCF cost rate

1 applied to a book value below market value. As shown, there is no realistic opportunity to earn
2 the market-based rate of return on book value. In this example, market price is 60% in excess of
3 book value and the investor expects a total return rate of 10.60%, based upon a growth rate of
4 5.40% and a dividend yield of 5.20% on market price. In this example, the 10.60% market-based
5 cost rate implies an annual return of \$2.544 comprised of \$1.248 in dividends and \$1.296 in
6 growth (market-price appreciation). When the 10.60% return rate is applied to book value which is
7 approximately two-thirds of market value, the total annual return opportunity is just \$1.590 on book
8 value. With an annual dividend of \$1.248, there is an opportunity for growth of \$0.342 which
9 translates to just 1.43% in contrast to the 5.40% in growth in market price expected by investors.
10 There is no way to possibly achieve the expected growth of \$1.296 (5.40%) absent a huge cut in
11 the annual dividend, an unreasonable expectation which would result in an extremely adverse
12 reaction by investors because it would be a sign of extreme financial distress.

13 In view of the foregoing, it is clear that the DCF model understates investors' required
14 cost of common equity capital when market values exceed their book values. Of course, if the
15 converse situation exists (market values substantially below their book values), a market-based
16 DCF-determined common equity cost rate applied to book value would be overstated.

17
18 Q. Have any commissions explicitly stated that the DCF model should not be relied upon exclusively?
19

20 A. Yes. As stated previously, the majority of regulatory commissions rely upon no single cost of
21 common equity model.

22 Specifically, the Iowa Utilities Board (IUB) has recognized the tendency of the DCF
23 model to understate investors' expected cost of common equity capital when market values are
24 significantly above their book values. In its June 17, 1994 Final Decision and Order in Docket No.
25 RPU-93-9 Re U.S. West Communications, the IUB stated:¹⁷

¹⁷ Public Utilities Reports - 152 PUR4th, Re: U.S. West Communications, Inc., Docket No. RPU-93-9, p. 459.

1
2 While the Board has relied in the past on the DCF model, in *Iowa Electric Light*
3 *and Power Company*, Docket No. RPU-89-9, "Final Decision and Order"
4 (October 15, 1990), the Board stated: "[T]he DCF model may understate the
5 return on equity in some circumstances. This is particularly true when the
6 market is relatively volatile and the company in question has a market-to-book
7 ratio in excess of one." Those conditions exist in this case and the Board will
8 not rely on the DCF return. (Consumer Advocate Ex. 367, See Tr. 2208, 2250,
9 2277, 2283-2284). *The DCF approach underestimates the cost of equity*
10 *needed to assure capital attraction during this time of market uncertainty and*
11 *volatility. The board will, therefore, give preference to the risk premium*
12 *approach.* (italics added)
13

14 Similarly, in 1994, the Indiana Utility Regulatory Commission (IURC), for example, recognized the
15 tendency of the DCF model to understate the cost of equity when market value exceeds book
16 value¹⁸:

17 In determining a common equity cost rate, we must again recognize the
18 tendency of the traditional DCF model, . . . to understate the cost of common
19 equity. As the Commission stated in *Indiana-Mich. Power Co.* (IURC 8/24/90),
20 Cause No. 38728, 116 PUR 4th 1, 17-18, *"the unadjusted DCF result is almost*
21 *always well below what any informed financial analyst would regard as*
22 *defensible, and therefore, requires an upward adjustment based largely on the*
23 *expert witness's judgement."* (italics added)
24

25 * * *

26
27 [u]nder the traditional DCF model . . . the appropriate earnings level of the utility
28 would not be derived by applying the DCF result to the market price of the
29 Company's stock . . . it would be applied to the utility's net original cost rate
30 base. *If the market price of the stock exceeds its book value, . . . the investor*
31 *will not achieve the return which the model finds is necessary.* (italics added)
32

33 Also, the Hawaii Public Utilities Commission recognized this phenomenon in a decision dated
34 6/30/92¹⁹ in a case regarding *Hawaiian Electric Company, Inc.*, when it stated:

35 In this docket, as in other rate proceedings, experts disagree on the relative
36 merits of the various methods of determining the cost of common equity. In this
37 docket, HECO is particularly critical of the use of the constant growth DCF
38 methodology. It asserts that method is imbued with downward bias and, thus,
39 its use will understate common equity cost. *We are cognizant of the*
40 *shortcomings of the DCF method.* There are, however, shortcomings to be
41 found with the use of CAPM and the RP methods as well. We reiterate that,
42

¹⁸ Public Utilities Reports - 150PUR4th, Re: Indiana-American Water Company, Inc., Cause No. 39595, pp. 167-168.

¹⁹ Public Utilities Reports - 134 PUR4th, Re: Hawaiian Electric Company, Inc., Docket No. 6998, p. 479.

1 despite the problems with the use of any methodology, *all methods should be*
2 *considered and that the DCF method and the combined CAPM and RP*
3 *methods should be given equal weight.* (italics added)

4
5 Most recently, the Pennsylvania Public Utility Commission, in its January 29, 1998
6 Opinion and Order in Docket Nos. R-00973947 and R-00973947 C0001 through C0014 re: United
7 Water Pennsylvania, Inc. (UWPA) stated:

8
9 In considering this matter, we observe that the ALJ correctly stated that we
10 have primarily relied on the DCF methodology in arriving at our determination of
11 the proper cost of common equity. We have, in numerous recent decisions,
12 determined the cost of common equity primarily based upon the DCF method
13 and informed judgment.

14 * * *

15
16 However, we have . . . recognized that the sole use of the DCF method can
17 result in an understatement of the common equity cost rates.

18 * * *

19
20 Our review of the record in this proceeding indicates that the Company
21 presented evidence in this proceeding to support a return on common equity as
22 high as 12.4 percent, as well as its recommended return of 11.9 percent.

23
24 We determine that, in light of all the evidence of record, UWPA is entitled to a
25 return on common equity of 11.00 percent. We recognize that it is within our
26 purview to exercise our informed judgment and to consider the higher risks as
27 evidenced by the Company's CAPM and RP analysis.

28 * * *

29
30 This is consistent with our recent decision in Roaring Creek, supra, wherein we
31 determined that a market-based cost of common equity for the Roaring Creek
32 Division of Consumers Pennsylvania Water company is 10.98 percent.

33
34 Q. Do other cost of common equity models contain unrealistic assumptions and have shortcomings?

35
36 A. Yes. That is why I am not recommending that any of the models be relied upon exclusively. I
37
38 have focused on the shortcomings of the DCF model because some regulatory commissions still
39
40 place excessive reliance upon it. Although the DCF model is useful, it is not a superior
41
42 methodology that supplants financial theory and market evidence based upon other valid cost of
43

common equity models. For these reasons, no model, including the DCF, should be relied upon exclusively.

3. Application of the Single-Stage DCF Model

a. Dividend Yield

Q. Please describe the dividend yield you used in your application of the single-stage DCF model.

A. The unadjusted dividend yields are based upon an average of a recent spot date (March 21, 2000) as well as an average of the three, six and twelve months ended February 29, 2000, respectively, which are shown on Exhibit No. 7, Schedule 10. The average unadjusted yield of 3.7% for the seven water companies and 5.2% for the eight utilities are shown on Schedule 10, Line Nos. 1 and 6 and individually for the companies in each proxy group on Schedule 12.

b. Discrete Adjustment of Dividend Yield

Q. Please explain the dividend growth component shown on Exhibit No. 7, Schedule 10, Line Nos. 2 and 7.

A. Because dividends are paid quarterly, or periodically, as opposed to continuously (daily), an adjustment to the dividend yield must be made. This is often referred to as the discrete, or the Gordon Periodic, version of the DCF model.

Since the various companies in the proxy groups increase their quarterly dividend at various times during the year, a reasonable assumption is to reflect one-half the annual dividend growth rate in the D_1 expression, or $D_{1/2}$. This is a conservative approach which does not overstate the dividend yield which should be representative of the next twelve-month period. Therefore, the actual average dividend yields on Line Nos. 1 and 6 of Schedule 10 have been adjusted upward to reflect one-half the growth rates shown on Line Nos. 4 and 9.

1
2 c. Selection of Growth Rates for Use in the DCF Model

3 Q. Please explain the basis of the growth rates of 5.3%/5.2% for the proxy group of seven water
4 companies and 4.8%/5.3% for the proxy group of eight utilities selected on the basis of least
5 relative distance which you use in your application of the DCF model.

6
7 A. Schedule 13 of Exhibit No. 7 indicates that 78.5% and 66.5% of the common shares of each proxy
8 group, respectively, are held by individuals as opposed to institutional investors. Individual
9 investors are particularly likely to place great significance on the opinions expressed by financial
10 information services, such as Value Line and I/B/E/S, which are easily accessible and/or available
11 on the Internet.

12 Forecasts by analysts, including Value Line, are typically limited to five years. In my
13 opinion, I believe that investors in water utilities would have little interest in historical growth rates
14 beyond the most recent five years. Consequently, the use of five-year historical and five-year
15 projected growth rates in earnings per share (EPS) and dividends per share (DPS) as well as the
16 sum of internal and external growth in per share value (BR + SV) is appropriate to consider in the
17 determination of a growth rate for use in this application of the DCF model. In addition, investors
18 realize that analysts have significant insight into the dynamics of the industries and they analyze
19 individual companies as well as companies' abilities to effectively manage the effects of changing
20 laws and regulations. Consequently, I have reviewed analysts' projected growth in EPS, as well
21 as historical and projected five-year compound growth rates in EPS, DPS and BR + SV for each
22 company in both proxy groups. The historical growth rates are from Value Line or calculated in a
23 manner similar to Value Line, while the projected growth rates in earnings are from Value Line and
24 I/B/E/S forecasts. I/B/E/S growth rate estimates are not available for DPS and internal growth,
25 and they do not include the Value Line projections. Thus, Value Line's estimates are not included
26 twice.

1 In addition to evaluating EPS and DPS growth rates, it is reasonable to assume that
2 investors also assess BR + SV. The concept is based on well documented financial theory that
3 future dividend growth is a function of the portion of the overall return to investors which is
4 reinvested in the firm plus the sales of new common stock. Consequently, the growth component
5 as proxied by internal and external growth is defined as follows:

$$6 \quad g = BR + SV$$

7 Where:

8 B = the fraction of earnings retained by the firm,

9 i.e., retention ratio

10 R = the return on common equity

11 S = the growth in common shares outstanding

12 V = the premium/discount of a company's stock price

13 relative to its book value, i.e., one minus the

14 complement of the market/book ratio.

15 Consistent with the use of five-year historical and five-year projected growth rates in EPS
16 and DPS, I have derived five-year historical and five-year projected BR+SV growth. Projected
17 EPS growth rate averages are shown on Line No. 9, while historical and projected growth in DPS,
18 EPS, and BR + SV is shown on Line No. 4, Schedule 10. All of these growth rates are
19 summarized for the companies in the proxy group on Schedule 14, page 1 of Exhibit No. 7.
20 Supporting growth rate data are detailed on pages 2 through 8 of Schedule 14. Pages 9 through
21 16 of Schedule 14 contain all of the most current Value Line Investment Survey (Standard Edition)
22 data for those companies in each proxy group which are covered in the Standard Edition of Value
23 Line Investment Survey.

24 As shown on page 1 of Schedule 14, growth rates for the proxy group of seven water
25 companies range from 3.3% to 7.6%, with a midpoint of 5.5% and an average of 5.0%, while
26 projected growth rates in EPS averaged 5.2%. Consequently, I conclude that growth rates of

1 5.3%/5.2% for the proxy group of seven water companies are suitable to use in the application of
2 the DCF model. Growth rates for the proxy group of eight utilities range from 3.1% to 6.1%, with a
3 midpoint of 4.6% and an average of 5.0%, while projected growth rates in EPS averaged 5.3%.
4 Consequently, I conclude that growth rates of 4.8%/5.3% for the proxy group of eight utilities are
5 suitable for use in the application of the DCF model.

6
7 d. Conclusion of Single-Stage DCF Cost Rates

8 Q. Please summarize the single-stage growth DCF model results.

9
10 A. As shown on Exhibit No. 7, Schedule 10, Line Nos. 5 and 10, the results of the applications of the
11 single-stage DCF model are 9.1%/9.0% for the proxy group of seven water companies and
12 10.1%/10.6% for the proxy group of eight utilities.

13
14 4. Application of the Quarterly Version of the DCF Model

15 Q. Please describe the quarterly version of the DCF model which you use to calculate the indicated
16 common equity cost rates.

17
18 A. The traditional, or annual, single-stage, DCF model is based upon the assumption that dividends
19 are paid annually. Virtually every utility pays dividends on a quarterly basis. The quarterly DCF
20 model takes into account the reality of quarterly payments of dividends to investors. As Morin
21 states²⁰ (Schedule 11, page 5):

22 By analogy, a bank rate on deposits that does not take into consideration the
23 timing of the interest payments understates the true yield if the customer
24 receives the interest payments more than one a year. The actual yield will
25 exceed the stated nominal rate.
26

27 The form of the model employed is shown in detail in Equation (7-2) shown on Schedule

²⁰ Id., p. 184.

11, page 5, an excerpt from Morin's text, Regulatory Finance: Utilities' Cost of Capital.

a. Selection of Market Prices for Use in the Quarterly Version of the DCF Model

Q. What periods of time have you used for market prices in order to employ the quarterly DCF model?

A. As indicated in Schedule 11, I employed the recent spot market prices as of March 21, 2000 as well as average market prices of the three, six and twelve months ended February 29, 2000 consistent with my application of the single-stage DCF model previously discussed.

b. Selection of Growth Rates for Use in the Quarterly Version of the DCF Model

Q. What growth rates did you use in your application of the quarterly version of the DCF model?

A. I utilized growth rates for each company based upon historical and projected growth in DPS, EPS, and BR+SV as well as based upon average projected growth in EPS calculated in a manner identical to the average growth rates for each proxy group previously discussed in this testimony.

c. Conclusion of Quarterly Version DCF Cost Rates

Q. Please summarize the quarterly DCF model results.

A. As shown on Exhibit No. 7, Schedule 11, pages 1 and 2, the results of the application of the quarterly version of the DCF model are 8.6%/9.1% for the proxy group of seven water companies and 10.5%/10.6% for the proxy group of eight utilities.

5. Conclusion of DCF Cost Rates

Q. Please summarize the DCF model results.

1
2 A. As shown on Exhibit No. 7, Schedule 9, the results of the applications of the DCF models are
3 9.0% for the proxy group of seven water companies and 10.5% for the proxy group of eight utilities
4 selected on the basis of least relative distance.
5

6 C. The Risk Premium Model (RPM)

7 1. Theoretical Basis

8 Q. Please describe the theoretical basis of the RPM.
9

10 A. Risk Premium theory indicates that the cost of common equity capital is greater than the
11 prospective company-specific cost rate for long-term debt capital. In other words, the cost of
12 common equity equals the expected cost rate for long-term debt capital plus a risk premium to
13 compensate common shareholders for the added risk of being unsecured and last-in-line in any
14 claim on the corporation's assets and earnings.
15

16 Q. Some analysts state that the RPM is another form of the CAPM. Do you agree?
17

18 A. While there are some similarities, there is a very significant distinction between the two models.
19 The RPM and CAPM both add a "risk premium" to an interest rate. However, the beta approach
20 to the determination of an equity risk premium in the RPM should not be confused with the CAPM.
21 Beta is a measure of systematic, or market, risk, a relatively small percentage of total risk, i.e., the
22 sum of both non-diversifiable systematic and diversifiable unsystematic risk. Unsystematic risk is
23 fully captured in the RPM through the use of the prospective long-term bond yield as can be
24 verified by reference to pages 3 through 9 of Exhibit No. 7, Schedule 2, which confirm that the
25 bond rating process involves an assessment of all business and financial risks. In contrast, the
26 use of a risk-free rate of return in the CAPM does not, and by definition can not, reflect a

1 company's specific, i.e., unsystematic risk. Consequently, a much larger portion of the total
2 common equity cost rate is reflected in the company-specific bond yield (a product of the bond
3 rating) than is reflected in the risk-free rate in the CAPM, or indeed even by the dividend yield
4 employed in the DCF model. Moreover, the financial literature recognizes the RPM and CAPM as
5 two separate and distinct cost of common equity models as discussed previously.

6 Q. Have you performed RPM analyses of common equity cost rate for the proxy group of seven
7 water companies and proxy group of eight utilities selected on the basis of least relative distance?
8

9 A. Yes. The results of my application of the RPM are summarized on page 1 of Exhibit No. 7,
10 Schedule 15. On Line No. 3, page 1, Schedule 15, I show the average expected yield on A rated
11 public utility bonds of 8.3%. On Line No. 4, I show the adjustments, if necessary, that need to be
12 made to the average 8.3% expected A rated utility bond yield so that the expected yield of 8.3% is
13 reflective of the proxy group of seven companies' average Moody's bond rating of A2 and 8.4% is
14 reflective of the proxy group of eight utilities' average Moody's bond rating of A3 as shown on
15 page 2 of Exhibit No. 7, Schedule 15. On Line No. 6 of page 1, my conclusions of an equity risk
16 premiums applicable to the proxy groups are shown while the total risk premium common equity
17 cost rates are shown on Line No. 7.
18

19 2. Estimation of Expected Bond Yield

20 Q. Please explain the basis of the expected bond yield of 8.3% and 8.4% applicable to the average
21 proxy group company in the proxy groups of seven water companies and eight utilities,
22 respectively.
23

24 A. Because the cost of common equity is prospective, a prospective yield on similarly-rated long-term
25 debt is essential. As shown on Schedule 15, page 2, the average Moody's bond rating for the
26 proxy group of seven water companies is A2 and A3 for the proxy group of eight utilities. I relied

1 on a consensus forecast of about 50 economists of the expected yield on Aaa rated corporate
2 bonds for the six calendar quarters ending with the second calendar quarter of 2001 as derived
3 from the March 1, 2000 Blue Chip Financial Forecasts (shown on page 7 of Schedule 14). As
4 shown on Line No. 1 of page 1 of Schedule 15, the average expected yield on Moody's Aaa rated
5 corporate bonds is 7.7%. It is necessary to adjust that average yield to be equivalent to a
6 Moody's A2 rated public utility bond. Consequently, an adjustment of 0.6% to the average
7 prospective yield on Aaa rated corporate bonds was required. It is shown on Line No. 2, page 1 of
8 Schedule 14 and explained in Note 2 at the bottom of the page. After adjustment, the expected
9 bond yield applicable to a Moody's A2 rated public utility bond is 8.3% as shown on Line No. 3,
10 page 1 of Schedule 14.

11 No adjustment is need to the expected yield of 8.3% on A rated public utility bonds
12 relative to the proxy group of seven water companies because the average Moody's bond rating of
13 the group is A2. However, an adjustment of 0.1%, as explained in Note (4) on page 1 of Schedule
14 15, is needed to the expected yield on A rated public utility bonds of 8.3% in order to reflect the
15 average Moody's bond rating of A3 for the proxy group of eight utilities. After such adjustments,
16 as necessary, the expected proxy group specific bond yields are 8.3% for the proxy group of
17 seven water companies and 8.4% for the proxy group of eight utilities.

18 19 3. Estimation of the Equity Risk Premium

20 Q. Please explain the method utilized to estimate the equity risk premium.

21
22 A. I evaluated the results of two different historical equity risk premium studies, as well as Value
23 Line's forecasted total annual return on the market over the prospective yield on high grade
24 corporate bonds, as detailed on pages 5, 6 and 8 of Exhibit No. 7, Schedule 15. As shown on
25 Line No. 3, page 5 of Schedule 15, the mean equity risk premiums based on both of the studies
26 are 4.7% applicable to the proxy group of seven water companies and 4.6% applicable to the

1 proxy group of eight utilities. This estimate is the result of an average of beta-derived historical
2 equity risk premium and a forecasted total market equity risk premium as well as the mean
3 historical equity risk premium applicable to public utilities with bonds rated A based upon holding
4 period returns.

5 The basis of the beta-derived equity risk premiums applicable to the proxy groups is
6 shown on page 6 of Exhibit No. 7, Schedule 15. Beta-determined equity risk premiums should
7 receive substantial weight because betas are derived from the market prices of common stocks
8 over a recent five-year period. Beta is a meaningful measure of prospective relative risk to the
9 market as a whole and is a logical means by which to allocate a relative share of the market's total
10 equity risk premium.

11 The total market equity risk premium utilized was 8.9% and is based upon an average of
12 both the long-term historical and forecasted market risk premiums of 7.4% and 10.3%,
13 respectively, as shown on page 6 of Exhibit No. 7, Schedule 15. To derive the historical market
14 equity risk premium, I used the most recent Ibbotson Associates' data on holding period returns
15 for the S&P 500 Composite Index and Salomon Brothers Long-term High-grade Corporate Bond
16 Index covering the period 1926-1999. The use of holding period returns over a very long period of
17 time is useful in the beta approach. As Ibbotson Associates'²¹ 2000 Yearbook states:

18 A long view of capital market history, exemplified by the 74-year period (1926-
19 1999) examined here, uncovers the basic relationships between risk and return
20 among the different asset classes, and between nominal and real (inflation-
21 adjusted) returns. The goal of this study of asset returns is to provide a period
22 long enough to include most or all of the major types of events that investors
23 have experienced and may experience in the future. Such events include war
24 and peace, growth and decline, bull and bear markets, inflation and deflation,
25 as well as less dramatic events that affect asset returns.

26 By studying the past, one can make inferences about the future. While the
27 actual events that occurred in 1926-1998 will not be repeated, the event-types
28 (not specific events) of that period can be expected to recur. *It is sometimes*
29 *said that only a few periods are unusual, such as the crash of 1929-1932 and*
30 *World War II. This logic is suspicious because all periods are unusual. Two of*
31 *the most unusual events of the century--the stock market crash of 1987 and*
32
33

²¹ Id., p. 27.

the equally remarkable inflation of the 1970s and early 1980s--took place just over a decade ago. From the perspective that historical event-types tend to repeat themselves, a 74-year examination of past capital market returns reveals a great deal about what may be expected in the future. (italics added)

And, in their 1999 Yearbook, Ibbotson Associates²² state:

Some analysts calculate the expected equity risk premium over a shorter, more recent time period on the basis that more recent events are more likely to be repeated in the near future; furthermore, the 1920s, 1930s and 1940s contain too many unusual events. This view is suspect because all periods contain unusual events. Some of the most 'unusual' events of this century took place quite recently. These events include the inflation of the late 1970s and early 1980s, the October 1987 stock market crash, the collapse of the high yield bond market, the major contraction and consolidation of the thrift industry, and the collapse of the Soviet Union -- all of which happened in the past 20 years. Without an appreciation of the 1920s and 1930s, no one would believe that such events could happen. More generally, the 73-year period starting with 1926 is representative of what can happen; it includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time-to-time and their return expectations reflect this. (italics added)

In addition, the use of long-term data in a RPM model is consistent with the long-term investment horizon presumed by the DCF model. Consequently, the long-term arithmetic mean total return rates on the market as a whole of 13.3% and on corporate bonds of 5.9% were used, as shown at Line Nos. 1 and 2 of page 6 of Exhibit No. 7, Schedule 15. As shown on Line No. 3 of page 6, the resultant long-term historical equity risk premium on the market as a whole is 7.4%.

I used arithmetic mean return rates were used because they are appropriate for cost of capital purposes. As Ibbotson Associates²³ states in their 1999 Yearbook:

The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values....Stated another way, the arithmetic mean is correct because an investment with uncertain returns will have a higher expected

²² Ibbotson Associates, Stocks, Bonds, Bills and Inflation - 1999 Yearbook, p. 156.

²³ Id., at pp. 157-158.

1 ending wealth value than an investment which earns, with certainty, its
2 compound or geometric rate of return every year....*Therefore, in the investment*
3 *markets, where returns are described by a probability distribution, the arithmetic*
4 *mean is the measure that accounts for uncertainty, and is the appropriate one*
5 *for estimating discount rates and the cost of capital.* (italics added)
6

7 Ex-post (historical) total returns and equity risk premium spreads differ in size and
8 direction over time. This is precisely why the arithmetic mean is important as it provides insight
9 into the variance and standard deviation of returns. This prospect for variance, as captured in the
10 arithmetic mean, provides the valuable insight needed by investors to estimate future risk when
11 making a current investment. Absent such valuable insight into the potential variance of returns,
12 investors cannot meaningfully evaluate prospective risk. As discussed previously, all of the cost
13 of common equity models, including the DCF, are premised upon the EMH, that all publicly
14 available information is reflected in the market prices paid. If investors relied upon the geometric
15 mean of ex-post spreads, they would have no insight into the potential variance of future returns
16 because the geometric mean relates the change over many periods to a constant rate of change,
17 thereby obviating the year-to-year fluctuations, or variance, critical to risk analysis.

18 The basis of the forecasted market equity risk premium can be found on Line Nos. 4
19 through 6 on page 6 of Exhibit No. 7, Schedule 15. It is derived from an average of the most
20 recent 12-month, 6-month, 3-month (using the months of March 1999 through February 2000) and
21 a recent spot (March 17, 2000) median market price appreciation potentials by Value Line as
22 explained in detail in Note 1 on page 3 of Exhibit No. 7, Schedule 16. The average expected price
23 appreciation is 80% which translates to 15.83% per annum and, when added to the average
24 (similarly calculated) dividend yield of 2.18% equates to a forecasted annual total return rate on
25 the market as a whole of 18.01%, rounded to 18.0%. Thus, this methodology is consistent with
26 the use of the 12-month, 6-month, 3-month and spot dividend yields in my application of the DCF
27 model. To derive the forecasted total market equity risk premium of 10.3% shown on Exhibit No.
28 7, Schedule 15, page 6, Line No. 6, the March 1, 2000 forecast of about 50 economists of the
29 expected yield on Moody's Aaa rated corporate bonds for the six calendar quarters ending with
30 the second calendar quarter 2001 of 7.7% from Blue Chip Financial Forecasts was deducted from

1 the Value Line total market return of 18.0%. The calculation resulted in an expected market risk
2 premium of 10.3%.

3 The average of the historical and projected market equity risk premiums of 7.4% and
4 10.3% is 8.85% rounded to 8.9%.

5 On page 9 of Exhibit No. 7, Schedule 15, the most current Value Line (Standard Edition)
6 betas for the companies in both proxy groups are shown.

7 Applying these betas to the average market equity risk premium of 8.9% yields an equity
8 risk premium of 4.8% for the seven water companies and 4.5% for the eight utilities selected on
9 the basis of least relative distance as shown on Exhibit No. 7, Schedule 15, page 6, Line No. 9.

10 A mean equity risk premium of 4.6% applicable to companies with A rated public utility
11 bonds was calculated based on holding period returns from a study using public utilities, as shown
12 on Line No. 2, page 5 of Exhibit No. 7, Schedule 15, and detailed on page 8 of the same
13 schedule.

14 The equity risk premiums applicable to the proxy group of seven water companies and
15 proxy group of eight utilities are the averages of the beta-derived premiums and those based upon
16 the holding period returns of public utilities with A rated bonds, as summarized on Exhibit No. 7,
17 Schedule 15, page 5, i.e., 4.7% and 4.6%, respectively.

18
19 Q. What are the RPM calculated common equity cost rates?

20
21 A. It is 13.0% for both the seven water companies and eight utilities as shown on Exhibit No. 7,
22 Schedule 15, page 1.

23
24 Q. Some critics of the RPM model claim that its weakness is that it presumes a constant equity risk
25 premium. Is such a claim valid?